Welcome to the ServSelect™ Family!

Thank you for purchasing a BLACK BOX® ServSelect product! We appreciate your business, and we think you'll appreciate the many ways that your new ServSelect will save you money, time and effort.

That's because the ServSelect family is all about breaking away from the traditional, expensive model of computer management. You know, the one-size-fits-all-even-if-it-doesn't model that says, "One computer gets one user station, no more, no less." Why not a single user station (monitor, keyboard, and mouse) for multiple computers—even computers of different platforms? Why not a pair of user stations, each of which can control multiple computers? Why not multiple user stations for the same computer?

With our ServSelect products, there's no reason why not. We carry a broad line of robust solutions for all these applications. Do you have just two PCs, and need an economical alternative to keeping two monitors, keyboards, and mice on your desk? Or do you need to share dozens of computers, including a mix of IBM® PC, RS/6000®, Apple® Macintosh®, Sun Microsystems®, and SGI™ compatibles among multiple users with different access levels? Does your switch have to sit solidly on a work table and use regular everyday cables? Or does it have to be mounted in an equipment rack and use convenient many-to-one cables? No matter how large or small your setup is, no matter how simple or how complex, we're confident we have a ServSelect system that's just right for you.

The ServSelect™ family from BLACK BOX—the one-stop answer for all your KVM switching needs!

*

This manual will tell you all about your new ServSelect IP VM, including how to install, operate, and troubleshoot it. For an introduction to the ServSelect IP VM, see Chapter 2. The ServSelect product codes covered in this manual are:

KV2116A KV2116E KV4116A KV4116E

This manual also includes information about the ServSelect software and the Server Access Modules (SAM), which have their own manuals or installation guides.

KV124A-PS2 KV124A-USB

FEDERAL COMMUNICATIONS COMMISSION AND INDUSTRY CANADA

RADIO-FREQUENCY INTERFERENCE STATEMENTS

This equipment generates, uses, and can radiate radio-frequency energy and if not installed and used properly, that is, in strict accordance with the manufacturer's instructions, may cause interference to radio communication. It has been tested and found to comply with the limits for a Class A computing device in accordance with the specifications in Subpart B of Part 15 of FCC rules, which are designed to provide reasonable protection against such interference when the equipment is operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference, in which case the user at his own expense will be required to take whatever measures may be necessary to correct the interference.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This digital apparatus does not exceed the Class A limits for radio noise emission from digital apparatus set out in the Radio Interference Regulation of Industry Canada.

Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de la classe A prescrites dans le Règlement sur le brouillage radioélectrique publié par Industrie Canada.

EUROPEAN UNION DECLARATION OF CONFORMITY

This equipment has been tested and found to comply with the limits for a Class A computing device in accordance with the specifications in the European standard EN55022. These limits are designed to provide reasonable protection against harmful interference. This equipment generates, uses and can radiate radio-frequency energy, and if not installed and used in accordance with the instructions, might cause harmful interference to radio or television reception.

However, there is no guarantee that harmful interference will not occur in a particular installation. If this equipment does cause interference to radio or television reception, which can be determined by turning the equipment on and off, you can correct the interference with one or more of the following measures:

a. Reorient or relocate the receiving antenna.

b. Increase the separation between the equipment and the receiver.

c. Connect the equipment to an outlet on a circuit different from that to which the receiver is connected.

d. Consult the supplier or an experienced radio/TV technician for help.

Shielded cables must be used with this equipment to maintain compliance with radio frequency energy emission regulations and ensure a suitably high level of immunity to electromagnetic disturbances. This equipment has also been found to comply with European standards EN50082 and EN60950.

CE

Japanese Compliance Statement

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1. Product Specification

Table 0.1: ServSelect IP VM appliance product specifications

Target Device Ports	
Number	16
Connectors	RJ45
Sync Types	Separate horizontal and vertical
Supported Cabling	4-pair UTP Cat5 or Cat6, 10 meters maximum length
Video Resolution	640 x 480 @ 60 Hz 1280 x 1024 @ 75 Hz (Remote Port Maximum using a VM SAM)
Serial Port	
Number	1
Cable type	Serial RS-232
Connector	DB9 female RJ4 with RJ45 to DB-9 (female) adaptor
Network Connection	
Number	1
Type	Ethernet: IEEE 802.3 2002 Edition - 10BASE-T, 100BASE-T, 1000BASE-T
Connector	RJ45
Local Port	
Number	1
Type	USB, PS/2, and VGA
Connectors	PS/2 miniDIN, 15 pin D, RJ45, USB Type A
USB Device Port	
Number	4
Type	USB 2.0
Dimensions	
Height x Width x Depth	1.72 in. x 17.00 in.x 11 in.; 1-U form factor (4.37 cm x 43.18 cm x 28 cm)1.10 x 8.08 x 6.30 in (2.80 x 20.51 x 16.00 cm)
Weight	7.3 lbs (3.31 kg)5.3 lbs (2.40 kg)1.1 lbs (0.50 kg) without cables

Table 0.1: ServSelect IP VM appliance product specifications (Continued)

	Heat Dissipation	105 BTU/hr
	Airflow	8 cfm
	Power consumption	30 Watts
	AC-input power	40 Watts maximum
	AC-input voltage rate	100 to 240 V AC Autosensing
	AC-input current rating	0.5 A RMS Max
	AC-input cable	18 AWG three-wire cable, with a three-lead IEC-320 receptacle and a country-dependent connector on the power resource end
	AC frequency	50 to 60 Hz autosensing
Ambient atmospheric condition ratings		
	Temperature	0^{o} to 50^{o} Celsius (32^{o} to 122^{o} Farenheit) operating -40^{o} to 70^{o} Celsius (-40^{o} to 158^{o} Farenheit) nonoperating
	Humidity	20 to 80% noncondensing operating 5 to 95% noncondensing nonoperating
Safety and EMC approvals and markings		
		UL, FCC class A, cUL, ICES-03 emissions, CE, VCCI Class A,
User Consoles		
	Type	PC running Windows NT, 2000 or XP OS and ServSelect console application Minimum Configuration-300MHz Pentium III, 64 MB RAM, 100BaseT NIC, XGA Video Recommended Configuration-450 MHz Pentium III, 128 MB RAM, 100BaseT NIC, SXGA Video

2. Product overview

The Black Box® ServSelect IP VM appliance integrates analog and digital keyboard, video, and mouse (KVM) switching technology with advanced cable management, access for two or four simultaneous users, and a user interface. The appliance has USB and PS/2® ports on the rear panel that support all major target device platforms.

2.1 Glossary

The following words are used throughout this documentation:

- **appliance** - equipment that provides KVM connectivity to attached target devices
- **SAM** - a Server Access Module that, when attached to the appliance and a target device, provides additional functionality such as virtual media sessions
- **switching system** - a set of appliances and attached target devices and SAMs
- **target device** - equipment such as a server or router that is attached to an appliance
- **user** - a KVM connection from a port on the appliance
- **virtual media** - a feature to allow a USB media device to be attached to the appliance and made available to any target device that is connected to the appliance

2.2 Features and benefits

- The ServSelect IP VM is a rack mountable KVM switch configurable for digital (remote) connectivity. It features High-Speed Rack Interface (AHI) ports for connecting servers and serial devices via SAM modules.
- Supports Universal Serial Bus (USB) virtual media.
- Video resolutions are supported up to 1280 x 1024 for remote users.

The ServSelect IP VM appliance includes up to four digital port sets for KVM-over-IP access, 16 target device interface ports for connecting SAMs and target devices, and virtual media capability for one local user and up to four remote users.

The ServSelect IP VM switch has user peripheral ports for PS/2 keyboards and mice. Additionally, virtual media such as generic removable media and CD drives can be connected to any one of four USB ports.

The appliance works over standard LAN connections. Users can access target devices across a 1000BASE-T LAN port that is used to establish an Ethernet connection, or directly through a local port. Users can access target devices across a 100BaseT LAN port that is used to establish an Ethernet connection, or directly through a local port.

The IP-based appliance gives you target device control from anywhere in the world.

Intelligent cables

You can use the following Server Access Modules (SAMs) with the appliance.

- **PS2M SAM** - PS/2 and VGA connectors
- **VM SAM** - USB2 and VGA connectors

NOTE:
PS2M SAM and VM SAM are required for virtual media connections.

- **SERIAL SAM** - Serial connectors

- **PS/2 SAM** - PS/2 connectors without virtual media capability
- **USB SAM** - USB connectors without virtual media capability.

PS2M SAM VM SAM

Figure 2-1. Examples of SAMs

These intelligent SAMs with Cat5 design dramatically reduce cable clutter while providing optimal digital display resolution and video settings. The built-in memory of the SAM simplifies configuration by assigning and retaining unique target device identification codes for each attached target device. This integrated intelligence enhances security and prevents unauthorized access to a target device through cable manipulation. The SAM is powered directly from the target device and proides Keep Alive functionality when the appliance is not turned on.

The SAMs enable direct KVM connectivity to target devices that are attached to the appliance. Each appliance has 16 target device interface ports for connecting SAMs.

The SAMs that work with the appliance support target devices with PS/2 and USB ports. When using the On Screen Display (OSD) interface in conjunction with SAMs, you can easily switch between platforms.

Virtual Media

The appliance supports virtual media when connected to a VM SAM. You can use virtual media support to connect USB media devices to the appliance and a USB media device that can be attached to the appliance and made available to any target device that is connected to the appliance with a VM SAM. Use virtual media to move data between a target device and USB media devices that are connected to the appliance. You can install, upgrade, or recover the operating system; update the BIOS code; or start the target device from a USB drive through the virtual media capabilities of the appliance.

Virtual media can be connected directly to the appliance using one of four USB ports on the appliance. In addition, virtual media can be connected to any remote workstation that is running ServSelect IP VM Software and is connected to the appliance using an Ethernet connection. To open a virtual media session with a target device, the target device must first be connected to the appliance using a VM SAM.

OSD graphical user interface

The appliance uses the OSD interface, which has menus to configure the switching system and select computers. You can list target devices by unique name, eID (electronic ID), or port number.

Security

Use the OSD interface to protect the switching system with a screen saver password. After a user-defined time, the screen saver mode engages and access is prohibited until the correct password is entered to reactivate the switching system.

Operation modes

The OSD user interface provides various operation modes for system administration of the appliance. Use these modes (Broadcast, Scan, Switch, and Share) to manage the switching activities. See Chapter 4, “Basic operations”, beginning on page 20 for more information.

Video

The appliance provides optimal resolution for VGA, SVGA, and XGA video. You can achieve resolutions of up to 1280 x 1024.

Flash upgradability

Upgrade the appliance at any time through the network port to ensure the appliance is always running the most current available version. See “Appendix A” beginning on page 45 for more information.

Accessing the appliance through network connection

Users access the appliance and all attached target devices through Ethernet from a client computer. A client computer can be anywhere a valid network connection exists.

Accessing target devices

When you access the ServSelect IP VM Software, a listing of all target devices you have permission to view and manage opens. When you select a target device from the list, the video of the selected target device opens in a Video Viewer window.

The following figure illustrates a typical appliance configuration.

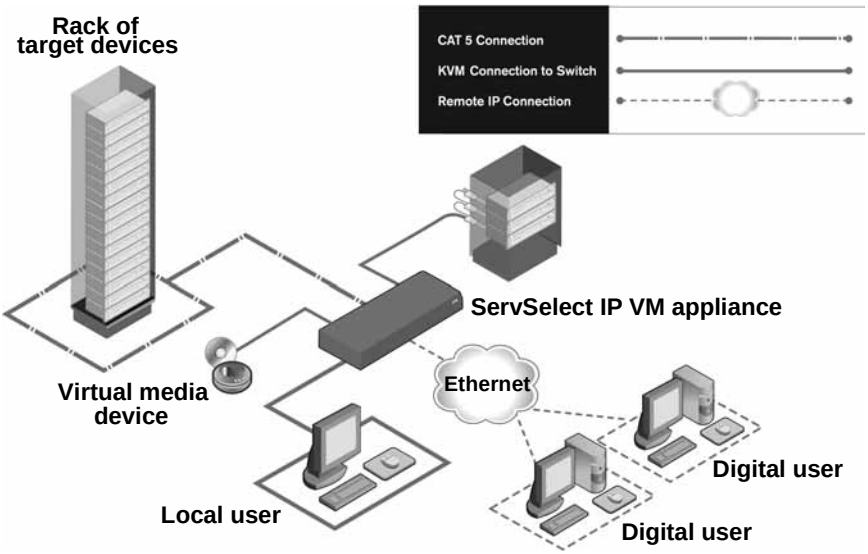

Figure 2-2. Example ServSelect IP VM appliance configuration

NOTE: To have server access to USB media device, utilize the LAN connection via the VM SAM path.

3. Installation

The appliance requires connectivity to a computer running ServSelect IP VM Software. Use ServSelect IP VM Software to view and control target devices (one at a time) attached to the appliance. The analog port does not require the ServSelect IP VM Software for operation. The analog port uses the OSD graphical user interface. For more information see the *ServSelect IP VM Software Installation and User's Guide.*

The appliance transmits KVM information between operators and target devices attached to the appliance over a network using either an Ethernet or local connection.

The appliance uses TCP/IP for communication over Ethernet. Although 10BASE-T Ethernet can be used, using a dedicated, switched 100BASE-T network or a 1000BASE-T network will improve performance.

3.1 Installation overview

To set up and install the appliance, complete the following steps:

1. Unpack the appliance and verify that all components are present and in good condition. See "Required items" on page 12.
2. Make all hardware connections between the power source, appliance, target devices, and the Ethernet. Make all hardware connections between the power source, switch, target device and the Ethernet. See "Safety precautions" on page 12.
3. Turn on the power and verify that all connections are working. See "Verifying Ethernet connections" on page 15.
4. To configure the appliance, complete one of the following steps:
   - You can use the console menu interface to configure the appliance. See Chapter 5, "Computer terminal operations", beginning on page 43.
   - You can use the ServSelect IP VM Software to configure the appliance. See the *ServSelect IP VM Software Installation and User's Guide* for detailed instructions.
5. Make the needed mouse setting adjustments. See "Adjusting mouse settings" on page 17.
6. Configure the OSD, which enables you to view and control the target devices, all from the local port.

Setting up the network

The appliance and SAMs use IP addresses to uniquely identify the appliance and the target devices. The appliance supports both Dynamic Host Configuration Protocol (DHCP) and static IP addressing. To avoid confusion, have IP addresses that are reserved for each appliance and remain static while the appliance is connected to the network. For additional information on setting up the appliance using the ServSelect IP VM Software, and for information on how the appliance uses TCP/IP, see the *ServSelect IP VM Software Installation and User's Guide*.

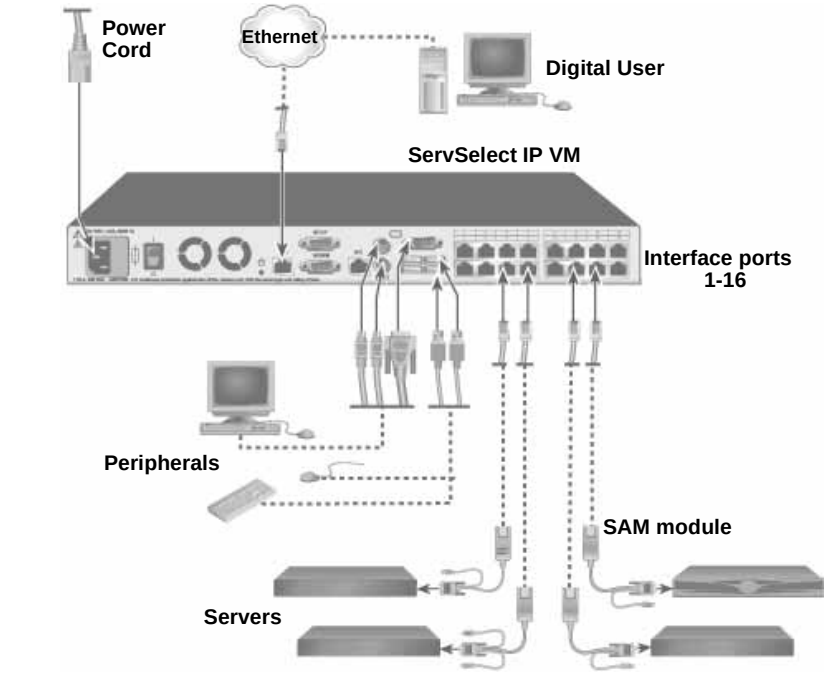

Figure 3-1. ServSelect IP VM configuration example

NOTE:
To open a virtual media session with a target device, the target device must first be connected to the appliance using a VM SAM or PS2M SAM.

3.2 Required items

Before you install the appliance, make sure that you have all the required items. The following items come with the appliance:

- Power cord
- Rack-mounting brackets
- ServSelect IP VM Installer/User Guide
- ServSelect IP Software Installation and User's Guide
- ServSelect IP VM Software CD
- Quick Installation Guide

In addition to the items that come with the appliance, you must provide one SAM (virtual media, KVM, or USB) and one Cat5 patch cable for each attached target device or appliance.

3.3 Safety Precautions

To avoid potential video and/or keyboard problems when using Black Box products:

- If the building has 3-phase AC power, ensure that the computer and monitor are on the same phase. For best results, they should be on the same circuit.

To avoid potentially fatal shock hazard and possible damage to equipment, please observe the following precautions:

- Do not use a 2-wire power cord in any Avocent product configuration.
- Test AC outlets at the target device and monitor for proper polarity and grounding.
- Use only with grounded outlets at both the target device and monitor. When using a backup Uninterruptible Power Supply (UPS), power the target device, the monitor and the switch from the UPS.

NOTE: The AC inlet is the main power disconnect.

Rack mount safety considerations

Elevated Ambient Temperature: If installed in a closed rack assembly, the operating temperature of the rack environment may be greater than room ambient. Use care not to exceed the rated maximum ambient temperature of the switch.

Reduced Air Flow: Installation of the equipment in a rack should be such that the amount of airflow required for safe operation of the equipment is not compromised.

Mechanical Loading: Mounting of the equipment in the rack should be such that a hazardous condition is not achieved due to uneven mechanical loading.

Circuit Overloading: Consideration should be given to the connection of the equipment to the supply circuit and the effect that overloading of circuits might have on overcurrent protection and supply wiring. Consider equipment nameplate ratings for maximum current. Consideration should be given to the connection of the equipment to the supply circuit and the effect that overloading of circuits might have on overcurrent protection and supply wiring. Consider equipment nameplate ratings for maximum current.

Reliable Earthing: Reliable earthing of rack mounted equipment should be maintained. Pay particular attention to supply connections other than direct connections to the branch circuit (for example, use of power strips). Reliable earthing of equipment should be maintained. Pay particular attention to supply connections other than direct connections to the branch circuit (for example, use of power strips).

3.4 Connecting the appliance hardware

To connect and turn on the appliance, complete the following steps:

1. Turn off the target devices that are part of the switching system. Connect one end of the power cord to the rear of the appliance and connect the other end to an AC power source.
2. Connect a VGA monitor and either PS/2 or USB keyboard and mouse cables into the labeled appliance ports. You must install both a keyboard and mouse on the local

ports or the keyboard will not initialize correctly. You cannot connect a DVI or EGA monitor to the appliance.

3. Connect one end of a Cat5 patch cable (4-pair, up to 10 meters) into a target device interface port and connect the other end into the RJ45 connector of a SAM. Plug one end of a Cat 5 patch cable (4-pair, up to 10 meters) into the SAM port and plug the other end into the RJ45 connector of a SAM module.
4. Connect the SAM into the correct ports on the rear of the target device. Repeat this procedure for all target devices that are to be connected to the appliance.
5. Connect a Cat5 patch cable from the Ethernet network into the LAN port on the rear of the appliance. Network users will access the appliance through this port.
6. If you are configuring the appliance using the console menu interface, connect a computer running terminal emulation software to the SETUP port on the rear panel of the appliance using a straight serial cable. If you will be configuring the switch using the console menu interface, connect a terminal or PC running terminal emulation software to the SETUP port on the back panel of the switch using the supplied cable. The terminal should be set to 9600 bits per second (bps), 8 bits, 1 stop bit, no parity, and no flow control. Otherwise, proceed to the next step.
7. Turn on each target device and then turn on the appliance. Power up the target device and then power up the appliance. After approximately one minute, the appliance completes initialization and opens the OSD graphical user interface **Free** tag on the local port monitor. After approximately one minute, the switch completes initialization and displays the target video on the local port monitor.
8. Use the ServSelect IP VM Software to configure the appliance. See the *ServSelect IP VM Software Installation and User's Guide* for detailed instructions.

Connecting a SAM to each target device

To connect a SAM to a target device, complete the following steps:

1. Attach the color-coded connectors of the SAM to the keyboard, monitor, and mouse ports on the first target device that you connect to the appliance.
2. Attach one end of the Cat5 cable to the RJ45 connector on the SAM.
3. Connect the other end of the Cat5 cable to a target device interface port on the rear of the appliance.
4. Repeat steps 1 to 3 for all target devices that you are attaching.

Connecting local peripheral devices

To connect local peripheral devices to the appliances, complete the following steps:

1. Connect a keyboard, monitor, and mouse to each set of color-coded ports on the rear of the appliance.
2. Bundle and label the cables for easy identification.

To connect local virtual media, complete the following step:

Connect the virtual media to any one of the four USB ports on the appliance. For all virtual media sessions, you must use a VM SAM.

3.5 Verifying Ethernet connections

The Ethernet connection has two LEDs. The green LED on the right is the Link indicator. It is lit when a valid connection to the network is established and it flashes when there is activity on the port. The amber/green LED on the left indicates that you are communicating at 100 Mbps (amber) or 1000 Mbps (green) when using the Ethernet connection.

3.6 Tiering multiple appliances

You can tier multiple appliances to enable up to four users to connect to up to 4096 target devices. For usability reasons, make sure that the ServSelect IP VM appliance is the top tier. The ServSelect IP VM appliance is not designed to be part of the second tier.

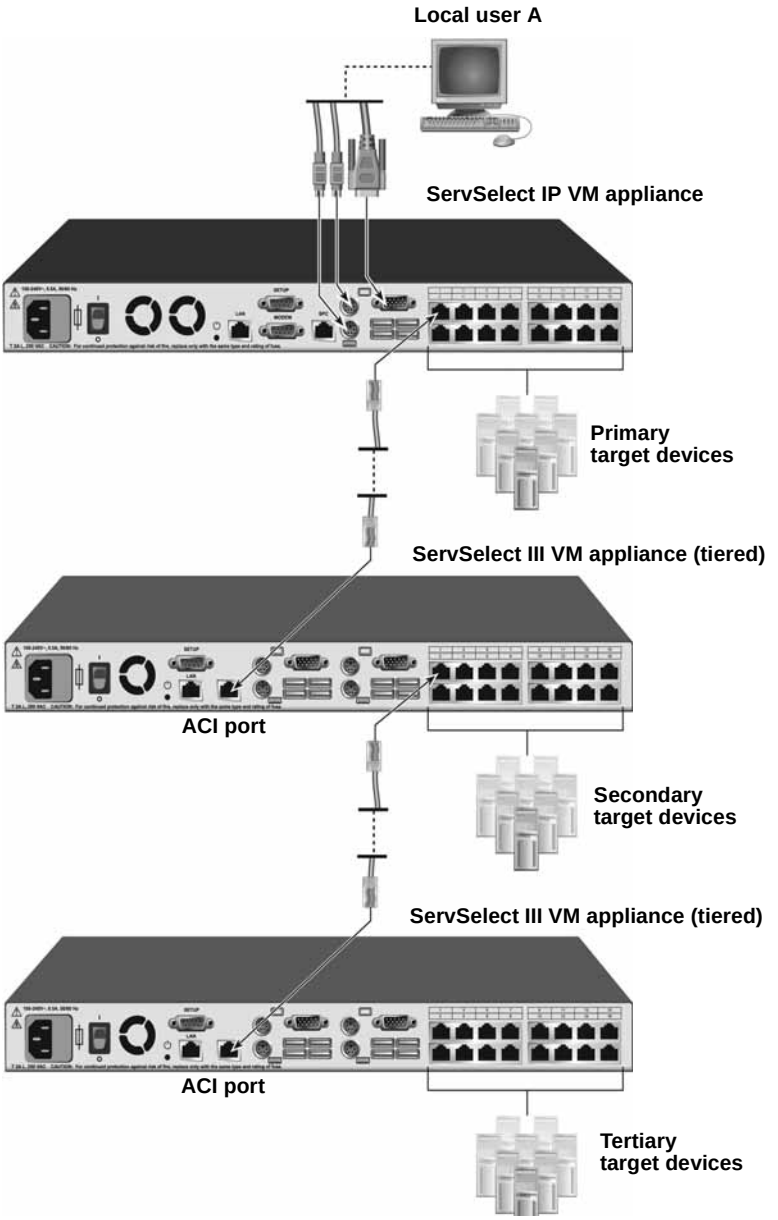

Figure 3-2. Appliance configuration with a tiered appliance

To tier multiple appliances, complete the following steps:

1. Connect the tiered appliance to each target device as described in “Connecting the appliance hardware” on page 13.

2. Connect the peripheral devices to the local user port on the main appliance. See “Connecting local peripheral devices” on page 14.
3. If the secondary appliance is a ServSelect III VM or ServSelect III, attach one end of the Cat5 cable to the ACI port on the tiered appliance.
4. Attach the other end of the Cat5 cable to one of the target device interface ports on the rear of the main appliance.
   The switching system will automatically merge the two appliances. All target devices that are connected to the tiered appliance are included in the main appliance target device list in the OSD interface. However, if you are tiering an earlier-model appliance, the list of appliances in the OSD interface will display both the primary appliance port number and the secondary or tertiary appliance port number. See “Adding earlier-model appliances” for more information.
5. Repeat steps 3 and 4 for all additional tiered appliances you want to attach.

3.7 Configuring ServSelect IP VM Software

See the *ServSelect IP VM Software Installation and User’s Guide* included on the CD with the software.

3.8 Adjusting mouse settings

Before a computer connected to the appliance can be used for remote user control, you must set the target mouse speed and turn off acceleration.

If you are experiencing slow mouse response during a remote video session, deactivate mouse acceleration in the operating system of the target device and set the mouse speed at 50%.

3.9 Adding earlier-model appliances

You can add earlier-model appliances for integration into the existing configuration. In a tiered system, each target device interface port will accommodate up to 16 target devices. When earlier-model appliances are tiered under the ServSelect IP VM appliance, the ServSelect IP VM appliance must be at the top level of the tier.

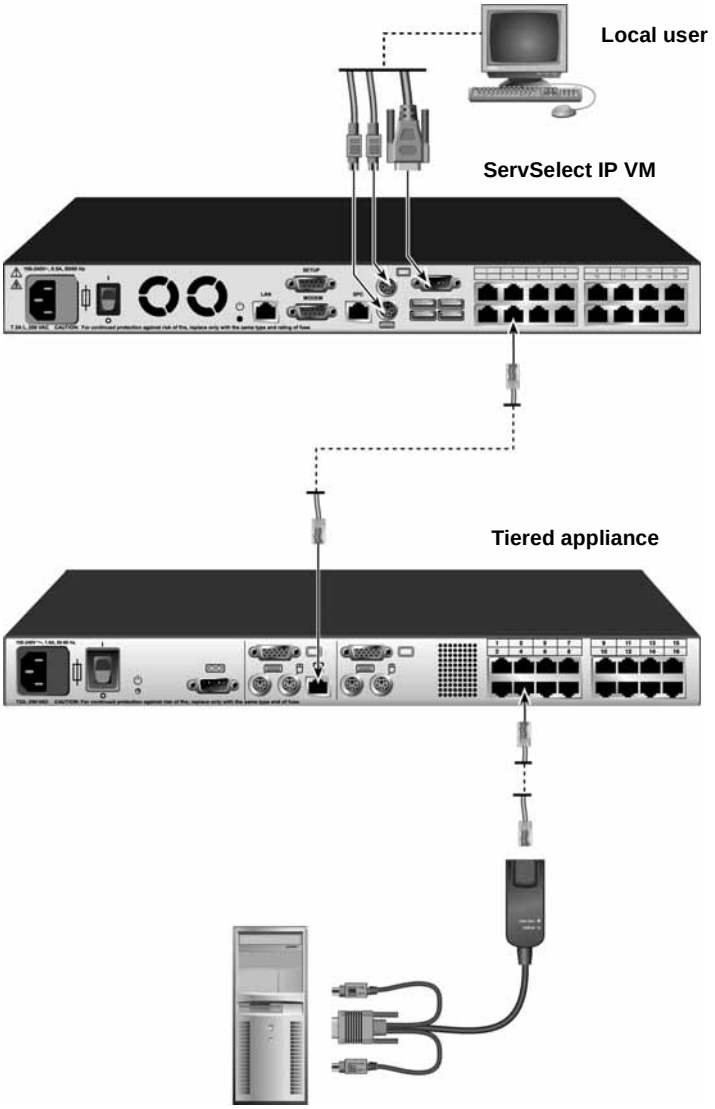

Figure 3-3. Appliance configuration with an earlier-model appliance

To attach an earlier-model appliance to the ServSelect IP VM appliance, complete the following steps:

1. Mount the earlier-model appliance into the rack according to the instructions that are included with that device.
2. Either attach the keyboard, monitor, and mouse connectors of a SAM to the local port on the tiered appliance and attach one end of a Cat5 cable to the end of the SAM, or attach one end of a Cat5 cable directly to the ACI port on the tiered appliance.

3. Connect the other end of the Cat5 cable to one of the target device interface ports on the rear of the appliance.
4. Turn off and turn on the target devices to the tiered appliance according to the instructions that are included with that device.
5. Turn off and turn on the tiered appliance to enable its local port to recognize the SAM.
6. Repeat steps 1 to 5 for all tiered appliances that you want to attach to the switching system.

The switching system will automatically merge the two appliances. All target devices that are connected to the tiered appliance are included in the main appliance target device list in the OSD interface. However, when an earlier-model appliance is connected to a PS2M SAM, the list of appliances in the OSD interface will display both the primary appliance port number, followed by a dash, and the secondary appliance port number. For example, the Port column for a secondary earlier-model appliance might display 01-02, where 01 is the primary port and 02 is the secondary port.

3.10 Setting up the appliance

With the appliance, you can auto detect and configure each port on the appliance. Chapter 4 provides detailed instructions on naming customization and OSD interface setup and configuration.

4. Basic operations

4.1 Controlling the switching system from the analog port

The appliance includes ports on the rear panel that you can use to connect a keyboard, monitor, and mouse to the appliance for direct analog access. The appliance uses the OSD interface, which has intuitive menus to configure the switching system and select target devices. Devices can be identified by customizable names.

4.2 Starting the OSD interface

You can view, configure, and control target devices in the switching system from the OSD interface from a KVM connection to the analog port.

To start the OSD interface, press Print Screen. Alternatively, you can press the Control, Alt, or Shift key twice within 1 second to start the OSD interface. You can use any of these key sequences instead of pressing Print Screen in any procedure in this document. To specify which key sequences can be used to start the OSD interface, click **Setup > Menu**.

The following illustration is an example of the Main window of the OSD interface.

Figure 4-1. Example of a Main window

The Main window lists the target devices in the switching system. You can order the list by target device names, eID numbers, or port numbers by clicking the **Name**, **eID**, or **Port** button.

The Port column indicates the target device interface port to which each target device is connected. If an earlier-model appliance is connected to a ServSelect IP VM appliance, the target device interface port number is shown first, followed by the number of the appliance port to which the target device is connected. For example, in Figure 3.1, the target device named Acton is connected to target device interface port 06 and appliance port 01.

The status of each target device in the switching system is indicated by one or more status symbols in the right column. The following table describes the status symbols.

OSD interface status symbols

Symbol	Description
	The SAM is online (green circle).
	The SAM is offline or is not operating correctly.
	The target device is tiered through another appliance. The target device and the appliance are online and have power.
	The target device is tiered through another appliance. The appliance is offline or does not have power.
	The SAM is being upgraded (yellow circle). When this symbol is visible, do not turn off and turn on the appliance or connected target devices and do not disconnect the SAM. Doing so might damage the SAM permanently.
	The SAM is being accessed by the indicated user channel (green channel letter).
	The SAM is blocked by the indicated user channel (black channel letter). For instance, in Figure 4.1, user C is viewing Forester, but is blocking access to Acton, Barrett, and Edie which are connected to the same SAM.
	A remote virtual media connection is established to the target device connected to the indicated user channel (blue letter).

You can set a screen delay to specify the length of time that elapses between when Print Screen is pressed and when the OSD interface starts. To set a screen delay, complete the following steps:

1. Press Print Screen to start the OSD interface.
2. In the Main window, click **Setup > Menu**.
3. In the **Screen Delay Time** field, type the number of seconds that you want to elapse between when Print Screen is pressed and when the OSD interface starts.

4.3 Connecting a user to a target device

Use the Main window of the OSD interface to select a target device to which you want to connect. When you select a target device, the keyboard and mouse are automatically reconfigured to the correct settings for that target device.

To select a target device, press Print Screen to start the OSD interface, and then use one of the following procedures:

- In the Main window, double-click the target device name, eID number, or port number.
- Type the port number, and press Enter.
- Type the first few characters of the target device name or eID number, and press Enter.

You can toggle between two selected target devices. To select the previously selected target device, press Print Screen and press Backspace.

To disconnect the user from a target device, press Print Screen and press Alt+0. A Free status flag in the OSD interface indicates that the user is not connected to a target device.

4.4 Using the OSD interface

This table describes the keys, key combinations, and mouse actions that you can use in the OSD interface. Two or more key names or mouse actions that are separated by commas indicate a sequence of actions. Two or more key names or mouse actions that are separated by a plus sign (+) indicate a combination of actions; that is, they are performed simultaneously.

You can use the main keyboard or the numeric keypad to type numerals, except when you use the Alt+0 key combination; you must use the 0 key on the main keyboard when you use Alt+0.

OSD interface navigation basics

Key, key combination, or mouse action	Result
Print Screen; Ctrl, Ctrl; Shift, Shift; or Alt, Alt	Start the OSD interface. To specify which key sequences can be used to start the OSD interface, click **Setup > Menu**.
Print Screen, Print Screen	Send the Print Screen keystroke to the currently selected target device. In other words, a screen capture will be performed for the target device. If Print Screen is not selected as startup key sequence in **Setup > Menu**, you only need to press Print Screen once to take a screen capture of the target device.
F1	Display help for the current window.
Escape	In the OSD main window: Close the OSD interface and return to the status flag on the desktop. In all other windows: Close the current window, without saving changes, and return to the previous window. In pop-up windows: Close the pop-up window and return to the current window.
Alt+X	Close the current window, without saving changes, and return to the previous window.
Alt+O	Click **OK** and return to the previous window.

OSD interface navigation basics (Continued)

Key, key combination, or mouse action	Result
Alt+port number	Select a target device to be scanned; *port number* is the port number of the target device.
Enter	Completes a switch in the Main window and exits the OSD interface. Click on an editable field to select the text for editing and enable the Left and Right arrow keys to move the cursor. Press Enter to quit the edit mode.
Print Screen, Backspace	Return to the previously selected target device.
Print Screen, Alt+0	Disconnect the user from the selected target device. Note that the zero must be typed on the main keyboard, not the numeric keypad.
Print Screen, Pause	Start the screen saver immediately and lock the user, if it is password-protected.
Up Arrow or Down Arrow	Move the cursor from line to line in a list.
Right Arrow or Left Arrow	When editing text in a field: Move within the text in the field. All other conditions: Move the cursor from column to column in a list.
Page Up or Page Down	Page through a list or help window.
Home or End	Move the cursor to the top or bottom of a list.
Delete	Delete the selected characters in a field or the selected item in the scan list. For more information about scan lists see “Scanning the switching system” on page 38.

4.5 Connecting local virtual media

You can connect virtual media directly to the appliance using the USB port on the appliance.
Note that all USB ports are assigned to a single virtual media session and cannot be independently mapped.

To start a local virtual media session, complete the following steps:

1. Press Print Screen to start the OSD interface. The Main window opens.
2. Connect the user to the target device with which you want to establish a virtual media session. Use the arrow keys to highlight the target device name, and then press Enter.
3. Press Print Screen to start the OSD interface again.
4. Click the VMedia button. The Virtual Media window opens.
5. Select one or more of the following check boxes:

- **Locked** - Select this check box to specify that when the user is disconnected from a target device, the virtual media is also disconnected.
- **Reserve** - Select this check box to specify that the virtual media connection can be accessed only by your user name and that no other user can connect to that target device. If both **Locked** and **Reserved** are selected, the session will be reserved.
- **CD ROM** - Select this check box to establish a virtual media CD connection to a target device. Clear this check box to end the connection.
- **Mass Storage** - Select this check box to establish a virtual media mass-storage connection to a target device. Clear this check box to end the connection.
- **Write Access** - Select this check box to enable the connected target device to write data to the virtual media during a virtual media session. Read access is always enabled during virtual media sessions.

6. Click **OK**.

4.6 Configuring the appliance and the OSD interface

To configure the appliance and the OSD interface, start the OSD interface and click **Setup**. The following illustration shows the Setup window.

Figure 4-2. Setup window

The following table describes the options in the Setup window.

Setup features to manage routine tasks for the target devices

Option	Purpose
Menu	Order the list of target devices by target device name, eID number, or port number. Set a screen delay to specify the length of time that elapses between when Print Screen is pressed and when the OSD interface starts.

Setup features to manage routine tasks for the target devices

Option	Purpose
Security	Set passwords to restrict access to the target devices. Enable the screen saver.
Flag	Change the display properties including timing, color, and location of the status flag.
Language	Specify the language that the interface is displayed in.
Devices	Specify the number of ports that are on the attached tiered appliance.
Names	Assign a unique name to each target device.
Keyboard	Specify the keyboard country code.
Broadcast	Simultaneously control multiple target devices through keyboard and mouse actions.
Scan	Set up a custom scan pattern for up to 16 target devices.
Preempt	Specify preemption settings.
Network	Specify the network speed and configuration, IP address, netmask, and gateway for the switching system.

Assigning target device names

Use the Names window to identify individual target devices by name rather than by port number. The Names list is always sorted by port order. Names are stored in the SAM, so even if you move the cable or target device to another target device interface port, the name and configuration are recognized by the appliance. If a target device is turned off, you cannot modify the name of the SAM.

To access the Names window, complete the following steps:

1. Press Print Screen to start the OSD interface. The Main window opens.
2. Click **Setup** > **Names**. The Names window opens.

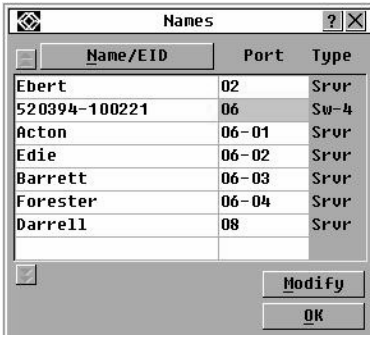

Figure 4-3. Names window

If new SAMs are discovered by the appliance, the on-screen list will be automatically updated. The mouse cursor will change into an hourglass during the update. No mouse or keyboard input will be accepted until the list update is complete.

To assign names to target devices, complete the following steps:

1. In the Names window, select a target device name or port number and click **Modify**. The Name Modify window opens.

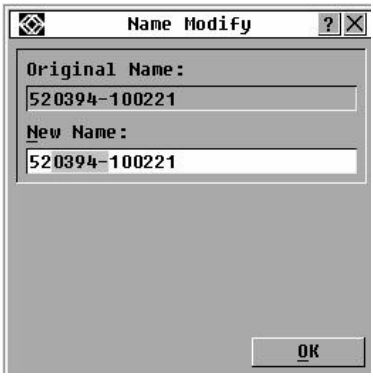

Figure 4-4. Name Modify window

2. Type a name in the **New Name** field. Names of target devices can be up to 15 characters long. Valid characters are A through Z, a through z, 0 through 9, space, and hyphen.
3. Click **OK** to transfer the new name to the Names window. The selection is not saved until you click **OK** in the Names window.
4. Repeat steps 1 to 3 for each target device in the switching system.
5. Click **OK** in the Names window to save the changes, or click **X** or press Escape to exit without saving changes.

If a SAM has not been assigned a name, the eID is used as the default name. To list target devices alphabetically by name, press Alt+N or click **Name** in the Main window.

Assigning device types

The ServSelect IP VM appliance automatically discovers attached tiered appliances, but you must specify the number of ports on the tiered appliance through the Devices window. Black Box Console Switches and other earlier-model appliances are listed in the Type category for the tiered appliance. When you select a configurable appliance from the list, the **Modify** button becomes available, so you can assign it the correct number of ports.

To access the Devices window, complete the following steps:

1. Press Print Screen to start the OSD interface. The Main window opens.
2. Click **Setup > Devices**. The Devices window opens.

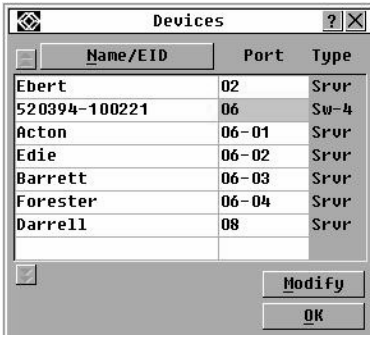

Figure 4-5. Devices window

When the appliance discovers a tiered appliance, the port numbering changes to accommodate each target device under that appliance.

For example, if the appliance is connected to target device interface port 6, the appliance port is listed as 06, and the target devices that are under it are numbered sequentially as 06-01, 06-02, and so on.

To assign a device type, complete the following steps:

1. In the Devices window, select the port number.
2. Click **Modify**. The Device Modify window opens.

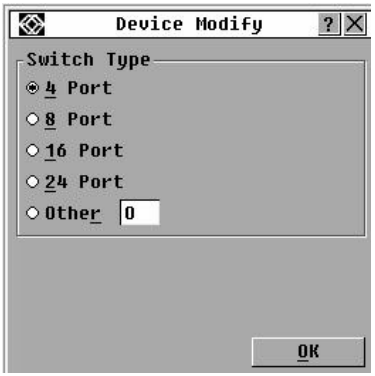

Figure 4-6. Device Modify window

3. Select or type the number of ports that are supported by the tiered appliance and click **OK**.
4. Repeat steps 1 to 3 for each port for which you want to assign a device type.
5. Click **OK** in the Devices window to save settings.

Changing the display behavior

Use the Menu window to change the order of the target devices and set a screen delay for the OSD interface. The display order setting affects the order in which target devices are listed in several windows, including the Main, Devices, and Broadcast windows.

To access the Menu window, complete the following steps:

1. Press Print Screen to start the OSD interface. The Main window opens.
2. Click **Setup** > **Menu**. The Menu window opens.

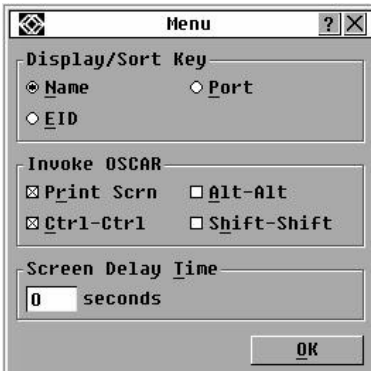

Figure 4-7. Menu window

To select the order of the target devices, complete the following steps:

1. Click one of the following buttons:

- Select **Name** to list the target devices alphabetically by target device name.
- Select **eID** to list the target devices numerically by eID number.
- Select **Port** to list the target devices numerically by port number.

Click **OK**.

To select a key combination to start the OSD interface, complete the following steps:

1. In the **Invoke OSD** section, select which key combinations you want to use to start the OSD interface, then press your selected combination.
2. Click **OK**.

You can set a screen delay so that you can select a target device using the keyboard without starting the OSD interface. A screen delay specifies the length of time that elapses between when Print Screen is pressed and when the OSD interface starts. To set a screen delay, complete the following steps:

1. Type the number of seconds (0 through 9) to specify the length of time that elapses between when Print Screen is pressed and when the OSD interface starts. If you specify 0, there is no delay.
2. Click **OK**.

Selecting display language

Use the Setup window to change the display language for the OSD interface.

Figure 4-8. Language window

To select a language for the OSD interface:

1. Press Print Screen to start the OSD interface. The Main window opens.
2. Click **Setup > Language**. The Language window opens.
3. In the Language window, select the language and click **OK**.

Controlling the status flag

The status flag is displayed on the desktop and indicates the name or eID number of the selected target device or the status of the selected port. You can specify the information that is displayed in the flag, the flag color, whether the desktop is visible through the flag,

whether the flag is displayed all the time, and where the flag is displayed on the desktop. The following table shows examples of status flags.

OSD interface status flags

Flag	Description
Darrell	Flag type by name.
520255-73F344	Flag type by eID number.
Free	Flag indicating that the user has been disconnected from all systems.
Darrell	Flag indicating that Broadcast mode is enabled.

To specify the status-flag settings, complete the following steps:

1. Press Print Screen. The Main window opens.
2. Click **Setup** > **Flag**.

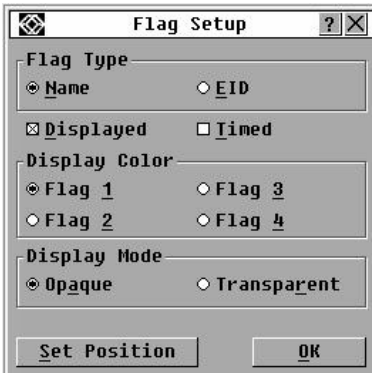

Figure 4-9. Flag Setup window

3. Set one or more of the following settings:

- Select **Name** or **eID** to specify the information that is displayed in the flag.
- Select **Displayed** to display the flag all the time, or select **Timed** to display the flag for only 5 seconds after you select a target device.
- In the **Display Color** section, select the flag color.
- Select **Opaque** to make the flag solid, or select **Transparent** to make the desktop visible through the flag.
- To specify the position of the flag, complete the following steps:
  a. Click Set Position.
  b. Hold down the left mouse button on the title bar of the Set Position window, and drag the window to the new location.

c. Press the right mouse button to close the Set Position window.

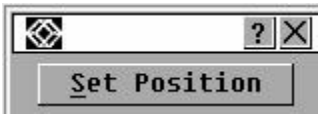

Figure 4-10. Set Position window

4. 4. Click OK to save the changes, or click X or press Escape to exit without saving the changes.

Setting the keyboard country code

By default, the appliance sends the US keyboard country code to USB cables attached to target devices and the code is applied to the target devices when they are turned on or rebooted. Codes are then stored in the SAM. Using a keyboard code that supports a language different from that of the appliance firmware will cause incorrect keyboard mapping.

If multiple keyboards are connected to the local port, they must be of the same type (PC or Mac) and of the same language. Only local users can view or change keyboard country code settings.

Issues might arise when you use the US keyboard country code with a keyboard of another country. For example, the Z key on a US keyboard is in the same location as the Y key on a German keyboard.

You can use the Keyboard window to send a different keyboard country code than the default US setting.

Figure 4-11. Keyboard window

To change the keyboard country code, complete the following steps:

1. Press Print Screen to start the OSD interface. The Main window opens.
2. Click **Setup > Keyboard**. The Keyboard window opens.
3. Select the country code for the keyboard, and click **OK**. Confirm the change in the Keyboard Warning window.

4. Click **OK** to save the change, or click **X** or press Escape to exit without saving the change.

Setting appliance security

You can enable a screen saver to start if the user remains unused for a specified length of time. When the screen saver starts, the user is disconnected from any target device to which it was connected. The screen saver stops when you press any key or move the mouse.

To immediately start the screen saver, press Print Screen and press Pause.

If you set a password, the keyboard and mouse are locked when the screen saver starts. When you press a key or move the mouse while the screen saver is running, a Password window opens, and you must type the password and click **OK** to unlock the keyboard and mouse.

Important: If you forget the password, you must call technical support. See "Appendix D" beginning on page 51 for contact information.

To enable the screen saver, complete the following steps:

1. Press Print Screen. The Main window opens.
2. Click **Setup > Security**. If a password is set, the Password window opens. Type the password and click **OK**.
3. Select the **Enable Screen Saver** check box.
4. In the **Inactivity Time** field, type the number of seconds (1 through 99) that must elapse before the screen saver starts.
5. If the monitor is Energy Star compliant, select **Energy**; otherwise, select **Screen**.
6. (Optional) To run the screen-saver test, click **Test**. The screen-saver test runs for 10 seconds.
7. Click **OK**.

To disable the screen saver, complete the following steps:

1. Press Print Screen. The Main window opens.
2. Click **Setup > Security**. If a password is set, the Password window opens. Type the password and click **OK**.
3. Clear the **Enable Screen Saver** check box.
4. Click OK.

A password must contain both alphabetic and numeric characters and can be up to 12 characters long. Passwords are case-sensitive. Valid characters are A through Z, a through z, 0 through 9, space, and hyphen.

To set or change a password, complete the following steps:

1. Press Print Screen. The Main window opens.
2. Click **Setup > Security**. If a password is already set, the Password window opens. Type the password and click **OK**.
3. Double-click the **New** field.
4. In the **New** field, type the new password.
5. In the **Repeat** field, type the password again.
6. Click **OK**.

To disable password protection, complete the following steps:

1. Press Print Screen. The Main window opens.
2. Click **Setup** > **Security**. In the Password window, type the password and click **OK**.
3. Double-click the **New** field. Leave the field blank, and press Enter.
4. Double-click the **Repeat** field. Leave the field blank, and press Enter.
5. Click **OK**.

4.7 Setting the preemption warning

Administrators and users with certain access rights can preempt (disconnect) KVM sessions and take control of the target device. You can choose whether or not to warn the first user that the session will be preempted and specify how long the appliance will wait for the first user to respond to the warning.

For more information about preempting sessions and preemption settings, see the *ServSelect IP VM Software Installation and User's Guide*.

To view or change the preemption warning settings, complete the following steps:

1. Press Print Screen. The Main window opens.
2. Click **Setup** > **Preempt**.
3. Enter a number of seconds in the **Timeout Seconds** field.
   - If you enter a value of 0 to 4 seconds, the first user will not be warned before the session is preempted.
   - If you enter a value of 5 to 120 seconds, the first user will be warned and will be allowed to continue using the target device for up to the amount of time in the **Timeout Seconds** field. The session will be preempted when the user clicks **OK**, or when the specified time elapses.
4. Click **OK** to save the settings.

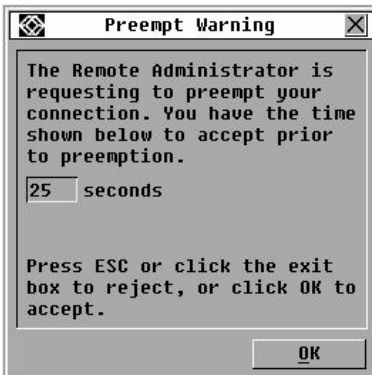
Preempt Warning
The Remote Administrator is requesting to preempt your connection. You have the time shown below to accept prior to preemption.
25 seconds
Press ESC or click the exit box to reject, or click OK to accept.
OK

Figure 4-12. Preempt window

4.8 Managing target device tasks using the OSD interface

From the Commands window, you can manage the switching system and user connections, enable the Scan and Broadcast modes, and update the firmware.

Commands to manage routine tasks for the target device

Feature	Purpose
SAM Status	View the version and upgrade status of the SAM.
Display Config	View current display settings.
Run Diagnostics	Configure and begin diagnostics on target devices.
Broadcast Enable	Begin broadcasting to the target devices. Configure a target device list for broadcasting under the Setup window.
Scan Enable	Begin scanning the target devices. Set up a target device list for scanning in the Setup window.
User Status	View and disconnect users.
Display Versions	View version information for the appliance as well as view and upgrade firmware for individual SAMs.
Device Reset	Re-establish operation of the keyboard and mouse.

To access the Commands window, complete the following steps:

1. Press Print Screen. The Main window opens.
2. Click **Commands**. The Commands window opens.

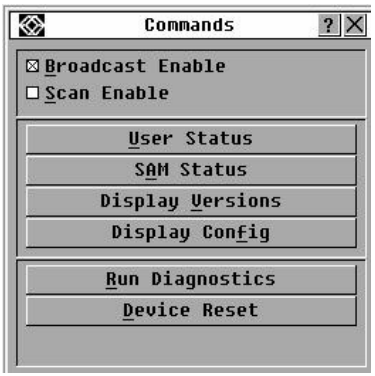

Figure 4-13. Commands window

Displaying version information

You can use the OSD interface to view the versions of the appliance and the SAM firmware. For more information, see “Appendix A” beginning on page 45.

To view version information, complete the following steps:

1. Press Print Screen. The Main window opens.
2. Click **Commands** > **Display Versions**. The Version window opens. The top pane of the window lists the subsystem versions in the appliance.

Figure 4-14. Version window

3. Click the **SAM** button to view individual SAM version information. The SAM Select window opens.
4. Select a SAM to view and click the **Version** button. The SAM Version window opens. For more information about loading firmware, see “Appendix A” beginning on page 45.
5. Click **X** to close the SAM Version window.

Upgrading the firmware

You can also use the OSD interface to upgrade the firmware available for the appliance. For optimum performance, keep the firmware current.

Figure 4-15. Upgrade window

To upgrade firmware, complete the following steps:

1. Press Print Screen. The Main window opens.
2. Click **Commands > Display Versions > Upgrade.** The Upgrade window opens.
3. Click **Upgrade**. A Warning window opens. Clicking **OK** opens the Upgrade Process window. The progress of the upgrade is indicated in the **Programmed** field.

Viewing the display configuration

Use the Display Configuration window to view the current configuration of the switching system.

To view the current configuration, click **Commands > Display Config**. The Display Configuration window opens and lists the current system configuration values.

Viewing and disconnecting user connections

You can view and disconnect users from target devices through the User Status window. The user (U) is always visible; however, you can display either the target device name or eID number to which a user is connected. If there is no user currently connected to a channel, the **User** and **Server Name** fields are blank.

To view current user connections, click Commands > User Status. The User Status window opens.

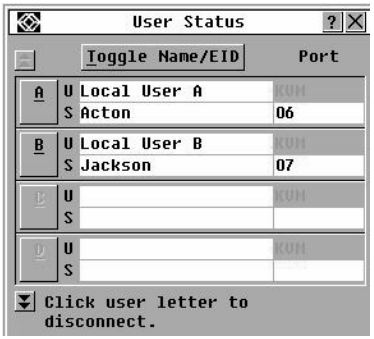

Figure 4-16. User Status window

To disconnect a user, complete the following steps:

1. From the User Status window, click the letter that corresponds to the user to disconnect. The Disconnect window opens.
2. Complete one of the following steps:
   - Click **OK** to disconnect the user and return to the User Status window.
   - Click **X** or press Escape to exit the window without disconnecting a user.

If the User Status list has changed since it was last visible, the mouse cursor will turn into an hourglass as the list is automatically updated. No mouse or keyboard input is accepted until the list update is complete.

Disconnect
User: J. Farley
Server: Ranier
EID: 000000-111111
Port: 04
Click the Disconnect button to disconnect the user from the server. Otherwise, click the close button or press Esc to exit.
Disconnect

Figure 4-17. Disconnect window

Resetting the keyboard and mouse

You can reset the keyboard and mouse by clicking **Commands > Device Reset**. If the keyboard or mouse is still not responding, you might be able to re-establish operation of

these peripheral devices by issuing a Reset command for the mouse and keyboard settings on the target device. The Reset command sends a hot-plug sequence to the target device, which causes the mouse and keyboard settings to be sent to the appliance. With communication re-established between the target device and the appliance, functionality is restored to the user. This function is for Microsoft Windows-based computers only. Resetting the keyboard and mouse on a target device running any other operating system might require that you reboot that target device.

To reset the mouse and keyboard values, complete the following steps:

1. Press Print Screen. The Main window opens.
2. Click **Commands** > **Display Versions > SAM**. Select the SAM connected to the mouse and keyboard that need to be reset from the list.
3. Click **Version** > **Reset**.
4. A message is displayed stating that the mouse and keyboard are reset.
5. Complete one of the following steps:
   - Click **OK** to close the message field.
   - Click **X** or press Escape to exit without sending a Reset command to the mouse and keyboard.

4.9 Scanning the switching system

In scan mode, the appliance automatically scans from port to port (target device to target device). Use scan mode to monitor the activity of up to 16 target devices, and to specify which target devices to scan and the number of seconds that each target device will be visible. The scanning order is determined by placement of the target device in the list, which is always shown in scanning order. You can choose to list the target devices by name, eID number, or port number by clicking the corresponding button.

To add target devices to the scan list, complete the following steps:

1. Click **Setup > Scan**. The Scan window opens.

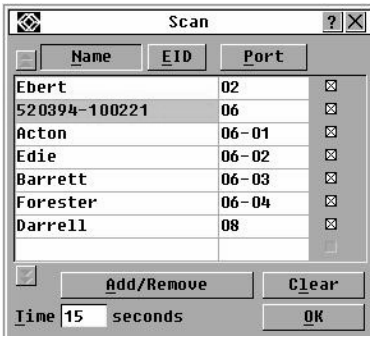

Figure 4-18. Scan window

2. The window contains a listing of all target devices that are attached to the appliance. To select target devices to be scanned, complete one of the following steps:

- Select the check box next to the target devices that you want to scan.
- Double-click on a target device name or port.
- Press Alt and the eID number of the target device that you want to scan. You can select up to 16 target devices from the list.

3. In the **Time** field, type the number of seconds (from 3 to 255) of time before the scan moves to the next target device in the sequence.
4. Click **OK**.

To remove a target device from the scan list, complete the following steps:

1. To select a target device to be removed from the scan list, complete one of the following steps:
   - In the Scan window, clear the check box next to the target device to be removed.
   - Double-click on the target device name or port.
   - Press Shift + Delete to remove the selected target device and all entries below it.
   - Click the **Clear** button to remove all target devices from the scan list.
2. Click **OK**.

To start the Scan mode, complete the following steps:

1. Click **Commands**. The Commands window opens.

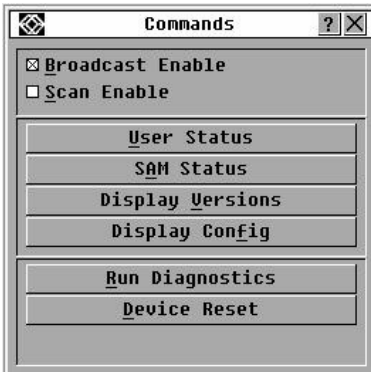

Figure 4-19. Commands window

2. Select **Scan Enable** in the Commands window. Scanning will begin immediately.
3. Click **X** to close the Commands window.

To cancel scan mode, complete one of the following steps:

- If the OSD interface is open, select a target device.
- If the OSD interface is not open, move the mouse or press any key on the keyboard to stop scanning at the currently selected target device.

4.10 Running switching system diagnostics

You can validate the integrity of the switching system through the Run Diagnostics command. This command checks the main board functional sub-systems (memory,

communications, appliance control, and the video channels) for each system controller. When you select the **Run Diagnostics** button, a warning will indicate that all users (remote and local) will be disconnected. Click **OK** to confirm and begin the test.

The Diagnostics window opens. The top section of the window opens the hardware tests. The bottom portion divides the tested SAMs into three categories: On-line, Offline or Suspect. SAMs might be listed as offline while being upgraded.

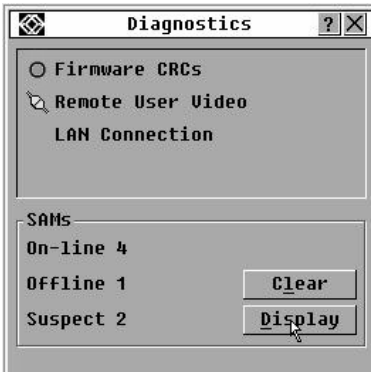

Figure 4-20. Diagnostics window

When the test is finished for an item, a pass (green circle) or fail (red x) symbol will be visible to the left of the item. The following table details each of the tests.

Diagnostic test details

Test	Description
Firmware CRCs	Reports on the condition of the main board RAM.
Remote User Video	Reports on the condition of the remote user video.
LAN Connection	Reports on the condition of the LAN connection.
On-line SAMs	Indicates the total number of currently connected and turned on SAMs.
Offline SAMs	Indicates the number of SAMs that have been connected successfully in the past and are turned off.
Suspect SAMs	Indicates the number of SAMs that have been detected, but are either unavailable for connection or have dropped packets during the ping tests.

To run diagnostic tests, complete the following steps:

1. Click **Commands > Run Diagnostics**. A warning message indicates that all users will be disconnected.

2. Click **OK** to begin diagnostics.
3. All users are disconnected and the Diagnostics window opens.
4. As each test is finished, a pass (green circle) or fail (red x) symbol is visible. The test is complete when the last test symbol is visible.

4.11 Broadcasting to target devices

The analog user can simultaneously control more than one target device in a switching system to ensure that all selected target devices receive identical input. You can choose to independently broadcast keystrokes or mouse movements.

- **Broadcasting keystrokes -** The keyboard state must be identical for all target devices that are receiving a broadcast to identically interpret keystrokes. Specifically, the Caps Lock and Num Lock modes must be the same on all keyboards. While the appliance attempts to send keystrokes to the selected target devices simultaneously, some target devices might inhibit and thereby delay the transmission.
- **Broadcasting mouse movements -** For the mouse to work accurately, all systems must have identical mouse drivers, desktops (such as identically placed icons), and video resolutions. In addition, the mouse must be in exactly the same place on all screens. Because these conditions are extremely difficult to achieve, broadcasting mouse movements to multiple systems might have unpredictable results.

You can broadcast to up to 16 target devices at a time, one target device per target device interface port.

To access the Broadcast window, complete the following steps:

1. Press Print Screen. The Main window opens.
2. Click **Setup** > **Broadcast**. The Broadcast window opens.

Figure 4-21. Broadcast window

To broadcast to selected target devices, complete the following steps:

1. Complete one of the following steps:
   - From the Broadcast window, select the **Mouse** or **Keyboard** check boxes for the target devices that are to receive the broadcast commands.

- Press the Up or Down Arrow keys to move the cursor to the target device. Then press Alt+K to select the **Keyboard** check box or Alt+M to select the **Mouse** check box. Repeat for additional target devices.

2. Click **OK** to save the settings and return to the Setup window. Click **X** or press Escape to return to the Main window.
3. Click **Commands**. The Commands window opens.
4. Select the **Broadcast Enable** check box to activate broadcasting. The Broadcast Enable Confirm/Deny window opens.
5. Click **OK** to enable the broadcast. Click **X** or press Escape to cancel and return to the Commands window.
6. If broadcasting is enabled, type the information or perform the mouse movements that you want to broadcast from the user station. Only target devices in the list are accessible. The other user is disabled when broadcast mode is enabled.

To turn broadcasting off, from the Commands window, clear the Broadcast Enable check box.

5. Computer terminal operations

5.1 The Console menu

Each appliance can be configured at the appliance level through the Console menu interface accessed through the configuration port on the rear of the appliance. All terminal commands are accessed through a terminal or computer running terminal emulation software. This is not the best method for setting options for the appliance. The preferred method is to make all configuration settings in the ServSelect IP VM Software. See the *ServSelect IP VM Software Installation and User's Guide* for more information.

Network configuration

To configure network settings using the Console menu, complete the following steps:

1. When you turn on the appliance, the appliance initializes for approximately one minute. After it completes initialization, press any key on the terminal or on the computer running the terminal emulation software to access the Console menu interface. The terminal can be connected at any time, even when the appliance is already turned on.
2. The Console Main menu opens. Type 1 and press Enter for the Network Configuration option. The Network Configuration menu opens.
3. Type 1 and press Enter to set the network speed. You should set the connection manually without relying on the auto negotiate feature. After pressing Enter, you are returned to the Network Configuration menu.
4. Type 2 and press Enter to specify whether you are using a static or Dynamic Host Configuration Protocol (DHCP) address. A static IP address can be used to provide a user-defined IP address, netmask, and default gateway for the appliance. Use a static IP address for ease of configuration. DHCP is a protocol that automates the configuration of TCP/IP-enabled computers. When DHCP is selected, the IP Address, Netmask, and Default Gateway settings are automatically assigned to the appliance and cannot be modified by a user. If you are using the DHCP option, configure the DHCP target device to provide an IP address to the appliance and then skip step 5.
5. Select the remaining options from the Network Configuration menu to finish the configuration of the appliance with an IP address, netmask, default gateway, and ping response.
6. Type 0 (zero) and press Enter to return to the Console Main menu. The appliance will then reboot.

Other Console Main menu options

Besides the Network Configuration option, the Console Main menu of the appliance has the following menu items: Firmware Management, Enable Debug Messages, Restore Factory Defaults, Reset Appliance, and Exit. Each is discussed in the following section.

Firmware Management

This menu contains the FLASH Download selection. For more information, see "Appendix A" beginning on page 45.

Enable Debug Messages

This menu option turns on console status messages. Because this can significantly reduce performance, you should only enable debug messages when instructed to do so by technical support. When you are finished viewing the messages, press any key to exit this mode.

Set/Change Password

The ServSelect IP VM switch can be set to a secure mode where the Terminal Applications menu cannot be accessed without first entering a password.

To activate security:

1. Select the *Set/Change Password* menu option. You will be prompted to decide if you wish to continue. Enter a **Y**.
2. Type a password for this switch and press **Enter**. This password may be up to 14 characters long.
3. You will be prompted to re-type the password. Once you complete this step, security will be active and you will not be able to access ServSelect IP VM switch terminal operations without the password.

To change the password:

1. Select the *Set/Change Password* menu option.
2. You will be prompted to type the old password and a new one.
3. Re-enter the new password to verify.

CAUTION:

This password places your or ServSelect IP VM switch terminal in a secure mode. This password should be guarded like any network password and care should be taken to avoid forgetting or misplacing it. In the event that you forgot the password, type Help. You will be given a one time use key to supply to technical support, who will then supply you with a one time use password that you can use to access the Serial Port..

Restore Factory Defaults

This menu option will restore all appliance options to the default settings.

Reset Appliance

You can use this menu option to initiate a soft reset of the appliance.

Exit

This menu selection will return you to the ready prompt.

Appendix A: Flash upgrades

You can use the appliance flash upgrade feature to update the appliance with the latest firmware available. This update can be performed using the ServSelect IP VM Software or using a Trivial File Transfer Protocol (TFTP) target device.

After the flash memory is reprogrammed with the upgrade, the appliance performs a soft reset, which terminates all SAM sessions. A target device experiencing a SAM firmware update might not be visible, or might be listed as disconnected. The target device opens normally when the flash update is completed. During an OSD interface-initiated upgrade, the SAM status indicator in the OSD interface Main window is yellow.

To upgrade the appliance firmware using the ServSelect IP VM Software, complete the following steps:

The preferred method for updating the firmware is to use the ServSelect IP VM Software. See the *ServSelect IP VM Software Installation and User's Guide* for detailed instructions. If you do not have a TFTP target device, you can find several shareware and freeware programs on the Internet that you can download and install.

To upgrade the appliance firmware using the Console menu interface, complete the following steps:

1. Go to http://www.Black Box.com/support/ and download the latest flash firmware. Save the flash upgrade file to the correct directory on the TFTP target device.
2. Connect a computer running terminal emulation software to the configuration port on the rear panel of the appliance using a straight serial cable.The terminal should be set to 9600 bps, 8 bits, 1 stop bit, no parity, and no flow control.
3. If the appliance is not on, turn it on now. After approximately one minute, press any key to access the Console Main menu.
4. The Console Main menu opens. Select the Firmware Management option. The current version of the firmware is opened on the Firmware Management menu.
5. Type 1 and press Enter to select FLASH Download.
6. Type the IP address of the TFTP target device and press Enter.
7. Type the name of the flash file and press Enter.
8. Confirm the TFTP download by typing a y or yes and pressing Enter.
9. The appliance will verify that the file you downloaded is valid. Next, you are prompted to confirm the upgrade. Type a y or yes and press Enter to confirm.
10. The appliance begins the flash upgrade process. On-screen indicators show the upgrade progress. After the upload is complete, the appliance resets and upgrades the internal subsystems.
11. After the upgrade is complete, a verification message is displayed.

Repairing damaged firmware

In the rare case that the firmware is damaged after a firmware upgrade (which might happen if the appliance is turned off and turned on during the upgrade process), the appliance will remain in boot mode. In this mode, the Power LED at the rear panel flashes at about 1 Hz, and the appliance attempts to restore the firmware over TFTP using the following default configuration:

- TFTP client IP address 10.0.0.2

- TFTP target device IP address 10.0.0.3
- Upgrade file name equal to CMN-XXXX.fl, where XXXX is the 4-digit Compliance Model Number (CMN) that is printed on the agency label of the appliance

To repair damaged firmware, complete the following steps:

1. Connect the appliance to the TFTP target device (using a cross-over cable or hub), which is set up with the default IP address (10.0.0.3).
2. Rename the upgrade file to the default file name (CMN-XXXX.fl).

The Power LED will flash at about 2 Hz when the appliance is downloading the upgrade file, and it will flash at about 4 Hz when it is programming the downloaded file to flash. After it has restored the firmware, the appliance reboots automatically and the Power LED is lit.

Appendix B: Virtual media

Virtual media and USB 2.0 constraints

The virtual media feature of ServSelect IP VM appliance enables you to connect to the USB port of an attached computer. With this feature, a user located at the appliance or using the remote software can access a local USB storage device, such as a USB CD drive, diskette drive, or flash drive, from an attached computer.

The VM SAM module is a composite device that addresses four functions: keyboard, mouse, CD drive, and mass storage device. The CD drive and mass storage device will be present on the target device whether or not a virtual media session is mapped. If a media device is not mapped, it is shown without media present. When a virtual media device is mapped to the target device, the target device will be notified that media has been inserted. When the media device is unmapped, the target device will be notified that the media was removed. Therefore, the USB virtual device is not disconnected from the target device.

The VM SAM presents the keyboard and mouse as a composite USB 2.0 device. Therefore the BIOS must support composite USB 2.0 human interface device (HID). If the BIOS of the connected computer does not support this type of device, the keyboard and mouse might not work until the operating system loads USB 2.0 device drivers. If this occurs, there might be a BIOS update provided by the computer manufacturer that will provide BIOS support for a USB 2.0 connected keyboard and mouse.

Booting a computer using virtual memory

In many cases the virtual media feature can boot an attached computer from a device attached to the USB port on the appliance. Most computers with a USB port can use virtual media; however, limitations in some USB media devices and the BIOS of some computers might prevent the computer from booting from a USB device attached to the ServSelect IP VM appliance.

Booting from a virtual USB device is dependant on the target device supporting booting from an external composite USB device. It also requires a CD of the operating system that supports external USB 2.0 booting. The following is a partial list of operating systems that support booting from an external USB 2.0 device:

- Windows Server 2003
- Windows XP
- Windows 2000 Server with Service Pack 4 (SP4) or later

To determine if your computer can be booted from virtual media, complete the following steps:

1. Connect a USB CD drive to the ServSelect IP VM appliance with an operating system installation CD that is bootable and map it to the target device. Reboot the target device to determine if it will boot from this attached CD drive. The BIOS might need to be set to boot from an external USB device.
2. If the target device will not boot, connect the USB CD drive to a USB port on the target device and reboot the target device. If the target device successfully boots from the CD drive, the BIOS is not supporting booting from a composite USB 2.0 device. Check the support Web site from the target device manufacturer to determine if a later BIOS is available that might support booting from a composite USB 2.0 device. If so, update the BIOS and retry.

3. If the target device is not capable of booting from an external USB 2.0 device, try the following methods to remotely boot this target device:
    - Some BIOS versions provide an option to limit USB speeds. If this option is available to you, change the USB port setting to “USB 1.1” or “Full Speed” mode and try booting again.
    - Insert a USB 1.1 card and try booting again.
    - Insert a USB 1.1 Hub between the VM SAM and the target device and try booting again.
    - Contact the manufacturer of the target device for information on availability or plans of a BIOS revision that will support booting from a composite USB 2.0 device.

Virtual media restrictions

The following list specifies restrictions for using virtual media:

- The ServSelect IP VM virtual media appliances only support connection of USB 2.0 diskette drives, flash drives, and CD drives.
- The ServSelect IP VM Software only supports mapping of USB 2.0 and USB 1.1 diskette drives and flash drives connected to the client computer.

Appendix C: UTP cabling

The following information is intended to brief you on various aspects of connection media. The performance of an switching system depends on high quality connections. Poor quality or poorly installed or maintained cabling can diminish system performance.This appendix is for information purposes only. Consult with the local code officials or cabling consultants prior to any installation.

UTP copper cabling

Switching systems utilize unshielded twisted pair (UTP) cabling.The following are basic definitions for the three types of UTP cabling that the appliance supports:

- Cat5 UTP (4-pair) high performance cable consists of twisted pair conductors, used primarily for data transmission. The twisting of the pairs gives this cable some immunity from the infiltration of unwanted interference. Cat5 cable is generally used for networks running at 100 or 1000 Mbps.
- Cat5E (enhanced) cable has the same characteristics as Cat5, but is manufactured to somewhat more stringent standards.
- Cat6 cable is manufactured to tighter requirements than Cat5E cable. Cat6 has higher measured frequency ranges and significantly better performance requirements than Cat5E cable at the same frequencies.

Wiring standards

There are two supported wiring standards for 8-conductor (4-pair) RJ45 terminated UTP cable: EIA/TIA 568A and B. These standards apply to installations utilizing Cat5, 5E, and 6 cable specifications. The switching system supports either of these wiring standards. Refer to the following table for details.

Table C.1: UTP wiring standards

Pin	EIA/TIA 568A	EIA/TIA 568B
1	white/green	white/orange
2	green	orange
3	white/orange	white/green
4	blue	blue
5	white/blue	white/blue
6	orange	green
7	white/brown	white/brown
8	brown	brown

Cabling installation, maintenance, and safety tips

The following is a list of important safety considerations that should be reviewed prior to installing or maintaining the cables:

- Keep all Cat5 runs to a maximum of 10 meters each.

- Maintain the twists of the pairs all the way to the point of termination, or no more that one-half inch untwisted. Do not skin off more than one inch of jacket while terminating.
- If bending the cable is necessary, make it gradual with no bend sharper than a one inch radius. Sharply bending or kinking the cable can permanently damage the interior of the cable.
- Arrange the cables neatly with cable ties, using low to moderate pressure. Do not over
  tighten ties.
- Cross-connect cables where necessary, using rated punch blocks, patch panels, and components. Do not splice or bridge cables at any point.
- Keep the Cat5 cable as far away as possible from potential sources of EMI, such as electrical cables, transformers, and light fixtures. Do not tie cables to electrical conduits or lay cables on electrical fixtures.
- Always test every installed segment with a cable tester. Toning alone is not an acceptable test.
- Always install jacks to prevent dust and other contaminants from settling on the contacts. The contacts of the jack should face up on the flush mounted plates, or left, right, or down on surface mount boxes.
- Always leave extra slack in the cables, neatly coiled in the ceiling or nearest concealed location. Leave at least five feet at the work outlet side and 10 feet at the patch panel side.
- Choose either 568A or 568B wiring standard before beginning. Wire all jacks and patch panels for the same wiring scheme. Don’t mix 568A and 568B wiring in the same installation.
- Always follow all local and national fire and building codes. Be sure to firestop all cables that penetrate a firewall. Use plenum rated cable where it is required.

Appendix D: Getting help and technical assistance

If you need help, service, or technical assistance or just want more information about Black Box products, you will find a wide variety of sources available from Black Box to assist you. This appendix contains information about where to go for additional information about Black Box and Black Box products, what to do if you experience a problem with your ServSelect system or optional device, and whom to call for service, if it is necessary.

Before you call

Before you call, make sure that you have taken these steps to try to solve the problem yourself:

- Check all cables to make sure that they are connected.
- Check the power switches to make sure that the system and any optional devices are turned on.
- Go to the Black Box support Web site at www.BlackBox.com/tech_support to check for technical information, hints, tips, and new device drivers or to submit a request for information.

You can solve many problems without outside assistance by following the troubleshooting procedures that Black Box provides in the online help or in the documentation that is provided with your Black Box product. If you suspect a software problem, see the documentation for the operating system or program.

Getting help and information from the World Wide Web

The Black Box Web site has up-to-date information about Black Box systems, optional devices, services and support. The address for Black Box www.BlackBox.com.